**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: **Katsumi MOCHITATE et al.** Art Unit: **1651**

Application Number: **10/551,052** Examiner: **Susan Marie Hanley**

Filed: **July 13, 2006** Confirmation Number: **1427**

For: **CELL CULTURE MEDIUM AND SOLIDIFIED PREPARATION OF CELL ADHESION PROTEIN OR PEPTIDE**

Attorney Docket Number: **053111**
Customer Number: **38834**

**RESPONSE TO RESTRICTION AND ELECTION OF SPECIES REQUIREMENT**

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

January 21, 2009

Sir:

This paper is submitted in response to the Office Action dated October 18, 2008, and is being filed along with a three month extension of time (January 19-20, 2008 being Federal Holidays).

Restriction Requirement

In the Office Action, restriction is required between Group I, (claims 1-15 and 28), Group II (claims 16-25), Group III (claims 26 and 27) and Group IV, (claims 29-34).

Applicants hereby elect the subject matter of Group I, (claims 1-15 and 28) for prosecution in this application.

Election of Species A

In the Office Action, election of species is required among the cell culture substrates listed in claims 2 and 10-12.

Applicants hereby elect the biobased polymer of claim 2.

In the Office Action, a further election of species is required among the biobased polymers listed in claim 3.

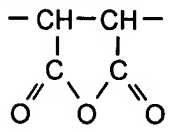
Applicants hereby elect the collagen of claim 3.

Additionally, Applicants note that while the Office Action states that claims 1 and 28 are generic to Species A, this is not a complete listing of generic claims. Applicants respectfully submit that claims 13-15 are also generic to Species A.

Election of Species B

In the Office Action, with respect to the hydrophobic binding-absorptive polymer [I] of claim 13, election is required of a value for each of $R^1$, X and Z.

As to $R_1$, Applicants hereby elect phenyl. As to X, Applicants hereby elect CH. As to Z, Applicants hereby elect acid anhydride as shown in the structure below (forms a binding ring together with X):



The above values represent the hydrophobic polymer MAST (styrene/maleic anhydride copolymer).

Additionally, Applicants note that while the Office Action states that claims 1 and 28 are generic to Species B, this is not a complete listing of generic claims. Applicants respectfully submit that claims 2-12 are also generic to Species B.

Traversal of Restriction Requirement

Applicants respectfully traverse the Restriction Requirement, and provide the following comments below. It is understood that Applicants' rights to the filing of a divisional application directed to the non-elected subject matter under 35 U.S.C. §120 and 35 U.S.C. §121 are retained. The Office Action alleges that there is no common special technical feature between the groups of claims because the features of claims 1, 16, 26 and 29 are disclosed by Banes et al. (U.S. Patent No. 4,789,601), as evidenced by Johnson et al. (U.S. Patent No. 6,503,490). Banes is the U.S. equivalent of JP 2-501529A, cited in the International Search Report.

In response, Applicants respectfully submit that Banes, as evidenced by Johnson does not disclose the embodiments as claimed. Banes involves processing the surface of polyorganosiloxane so that a cell can adhere thereon, for utilizing polyorganosiloxane (silicone rubber) as an elastic cell culture substrate. Firstly, it is noted that polysiloxane is a chained compound of silicon having Si-O-Si bond. Since the presence of "organo" in polyorganosiloxane, it is presumed that there is "Si-R" (R = an organic side chain). For this purpose, the specification teaches following approaches:

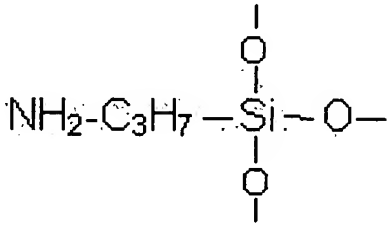
1) A cured or uncured membrane polyorganosiloxane is suspended over a Bunsen Burner flame. The fine soot (elemental carbon) particles generated from the flame penetrate and are embedded in the surface of polyorganosiloxane, which has been softened by the flame heat. Because the embedded elemental carbon particles functions as a cell adhesion scaffold, the bioincompatible polyorganosiloxane is conferred biocompatibility. See column 3, lines 34-41.

2) The surface of cured polyorganosiloxane membrane is aminated by ammonia treatment ($NH_3$ vapor, $NH_4Cl$, $NH_4HCO_3$) with a strong acid (HCl, HF, HBr). Positive

charge and hydrophilicity are conferred on the surface of polyorganosiloxane membrane by the amination treatment, and biocompatibility is thus demonstrated. See column 3, line 42-61.

3) The method of "2)", above, is optionally followed by reaction of aldehydes to form a Schiff base. When peptide is added at this stage, the $NH_2$ group (amino group) of the peptide reacts with the Schiff base, and the surface of polyorganosiloxane membrane is peptidated from the state of being aminated. Because the carboxyl terminal COOH group (the C-terminus COOH group) of the peptide stands out from the surface, the polyorganosiloxane membrane surface can acquire the negative charge of the COOH group and a hydrophilic property. See column 3, lines 62 to column 4, line 20.

4) A chemical treatment is described in which the polyorganosiloxane surface is co-cured with a primary amine, or a silicon compound having a COOH group (silane), or siloxane, whereby -$NH_2$ (amino group) or COOH (carboxyl group) is added on the polyorganosiloxane surface. For example, 3-aminopropyltriethoxysilane is allowed to react with Si-O-Si of polyorganosiloxane to cause cleavage of the Si-O bond to introduce 3-aminopropyl group as in Figure 1:




See column 4, lines 21-52.

In any of the above cases, the method employed by Banes for conferring hydrophilic and cell adhesion properties on the surface of polyorganosiloxane was a physical embedding (1) or a chemical-bond formation ((2), (3) and (4)).

As to Johnson, the Office Action alleges that this reference to support the position that polyorganosiloxanes are allegedly inherently hydrophobic and have linear structures, citing column 6, lines 50-55. However, referring to liquid polyorganosiloxanes, Johnson states that "such materials may be cyclic or linear." Therefore, Applicants respectfully note that polyorganosiloxanes are not inherently linear, since they may be linear or cyclic. As to the remaining disclosure of Johnson, this reference relates to an anti-microbial and deodorant composition which is totally different from the claimed embodiments. Accordingly, Applicants respectfully submit that Johnson does not further evidence any disclosure of Banes.

On the other hand, in the claimed embodiments, binding with the cell culture substrate (corresponds to polyorganosiloxane in Banes, as evidenced by Johnson) depends on a hydrophobic bonding with a hydrophobic group in the amphipathic compound (described in the present specification), and it is never based on a physical embedding (1) or a covalent bonding ((2), (3) and (4)) of Banes, as evidenced by Johnson. A single hydrophobic-bonding energy is far smaller than chemical-bonding energy, but a stable binding with various cell culture substrates described in the claims can be achieved by summation of the hydrophobic bindings of the multiple hydrophobic side chains bound to the flexible main chain. The claimed embodiments do not rely on polyorganosiloxane as a culture substrate as in Banes, as evidenced by Johnson.

As to claim 1, polyorganosiloxane of Banes, as evidenced by Johnson, is a compound having Si-O-Si structure, but it does not have a hydrophobic linear skeleton as is described in claim 1 of the present application.

As to claim 16, it is described in Banes, as evidenced by Johnson, that peptidation on the surface of polyorganosiloxane confers cell-adhesion properties and biocompatibility by the negative charge occurred from COOH group of the peptide C-terminus. The present specification does not describe that the C-terminus of the peptide to be bound is COOH. There is no difference in the performance between –COOH and amidated C-terminus (-$CONH_2$). Further, as exemplified in claim 24, peptides not comprising charge on the side chain (A5G71, A5G77, A5G77f) are also functional.

As to claim 26, the property described in this claims does not rely on polyorganosiloxane itself and is achieved by conducting a series of chemical reaction (amination → Shiff base formation → peptidation). The claimed embodiments are different from Banes, as evidenced by Johnson, at least in that the claimed embodiments comprises in the polymer molecule a reaction group that can be chemically bound to peptide and that the polymer can be coated onto the culture substrate while preserving the reaction group.

For at least the above reasons, Applicants respectfully submit that Banes, as evidenced by Johnson, does not disclose the embodiments as claimed. As such, Applicants respectfully submit that claimed embodiments include a "special technical feature." Accordingly, Applicants respectfully submit that since there is a technical relationship among the claims involving the

"special technical feature," the present claims comply with unity of invention. See 37 CFR §1.475. Therefore, Applicants respectfully traverse the restriction requirement.

If this paper is not timely filed, Applicant(s) respectfully petition(s) for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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